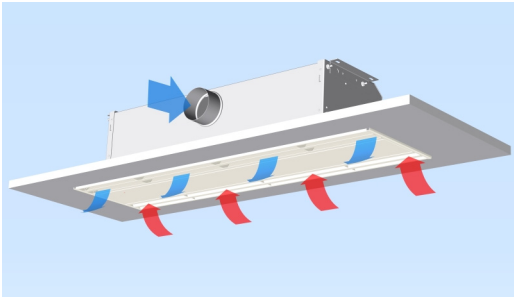


Technical Brochure

# LTG Air-Water Systems

## LTG Induction

Active chilled beams HDC



Ceiling installation

# Active chilled beams for ceiling installation

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## Notes

Dimensions stated in this brochure are in mm.

Dimensions stated in this brochure are subject to General Tolerances according to DIN ISO 2768-vL.

For the outlet grille special tolerances stated in the drawing apply.

Straightness and twist tolerances for extruded aluminium profiles according to DIN EN 12020-2.

The surface finish is designed to meet the requirements for applications in buildings - room climate according to DIN 1946 part 2. Other requirements on request.

The actual specifications are at the end of this document. They are available as a word document at your local distributor or at [www.LTG-AG.de](http://www.LTG-AG.de).

## Active chilled beams for ceiling installation

LTG offers active chilled beams for all room air flow patterns:

- Tangential air flow from the ceiling
- Mixed air flow from the ceiling
- Mixed/displacement air flow (Indivent flow) from the ceiling

Active chilled beams are units for induction systems.

The induction system is a combined air and water system:

- The air system ensures ventilation and room air humidity control.
- The water system, which is very economical for the transport of energy, additionally heats or cools the air using heat exchangers.

This provides the two most significant features of the induction unit: energy-saving operation and low space requirements.

### Mode of Operation

The primary air (outside air required for ventilation) from the central air conditioning unit is discharged through nozzles at high speed. This pulls in secondary air from the room.

The secondary air flows into the unit through a heat exchanger being heated or cooled.

The primary air is mixed with the heated or cooled secondary air inside the unit and flows through an outlet grille or diffuser into the room.

### Models

LTG offers different models and sizes for any application. The main distinctive feature of the LTG active chilled beams is the way the temperature is controlled.

#### Two-pipe system

The unit has only one heat exchanger through which chilled water flows for cooling and hot water for heating. Therefore, it is only possible to either heat or cool within a single water circuit.

#### Four-pipe system

The unit has two separate water systems, one for heating, the other one for cooling. Therefore, chilled and hot water always remain separate. The four-pipe system fulfills all requirements on varying loads and small control zones.


#### Valve control (water-side control)

The heating or cooling output of the heat exchanger is controlled by modifying the water flow.

#### Damper control (air-side control)

The heating or cooling output is controlled by modifying the flow of secondary air. Adjustable dampers guide the air current through the air cooler or the air heater or they divert the secondary air through a bypass avoiding the heat exchanger. The water flow remains constant.

### Product overview active chilled beams for ceiling installation

Type	Active chilled beam type HDC
View of units	
Application	Specifically designed for low band grid ceilings. In the cooling mode, the facade-heated air enters the unit the shortest way and is immediately cooled.
Water system	2-pipe system, 4-pipe system
Options	Blind diffuser
Installation	In T-bar, grid and plasterboard ceilings Flanged, recessed
Supply air pattern	1-way

## Active chilled beams for ceiling installation Type HDC

### View of unit



Active chilled beam type HDC 1000 (4-pipe system)

### Application

The active chilled beam type HDC 1000 is specifically designed for installation in false ceilings. In the cooling mode room air is heated at the facade, entrained into the unit, cooled and recirculated to the room.

### Installation, positioning

Flanged or recessed frame options.

### Mode of operation

Primary air is pushed through internal metal nozzles, which induces room air through a heat exchanger where it is cooled or heated. The primary air is mixed with the heated or cooled secondary air and delivered into the room.

For hygienic reasons should the unit be operated without condensation and not be used for dehumidification.

### Specification

The active chilled beam type HDC 1000 is available as:

- 4-pipe system for cooling and heating
- 2-pipe system for cooling or heating

### Advantages

- Virtually noiseless operation
- Low installation height (240 mm)
- Pleasing, combined air inlet/outlet grille
- High thermal comfort in the occupied zone
- Condensate-free operation
- Fresh air supply to the room
- Non combustible metal housings and nozzles
- Maintenance-friendly design. Valves and heat exchanger are easily accessible by removing the grille.
- Energy efficient through use of low primary flow rates and low static pressure at the primary air duct

### Indoor air flow pattern for cooling mode

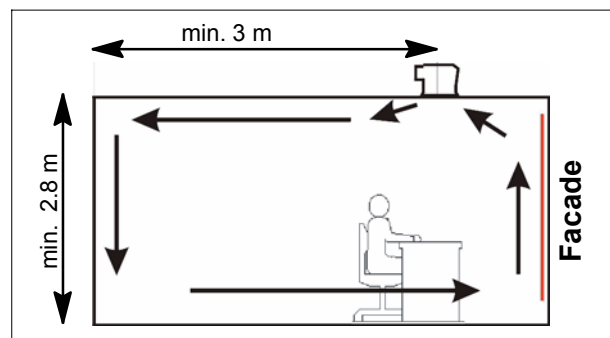
Room air heated at the facade is drawn directly into the units where it is cooled. Supply air diffused along the ceiling, mixes with the ambient air to reduce air velocity and temperature difference.

High thermal comfort

up to 50 W/m<sup>2</sup> or 7.5 m<sup>3</sup>/hm<sup>2</sup> (primary air).



### Recommended installation position for 2-pipe system (cooling only)



Section through a typical office room, length = 6 m, height = 2.8 m. Schematic illustration of indoor air flow.

## Active chilled beams for ceiling installation Type HDC

### Technical data size 1000, 4-pipe system - cooling and heating

V [m <sup>3</sup> /h]	Δp [Pa]	L <sub>A18</sub> [dB(A)]	L <sub>wA</sub> [dB(A)]	Q <sub>p</sub> /Δt [W/K]	Q <sub>k</sub> /Δt [W/K]	Q <sub>k</sub> <sup>1)</sup> [W]	Q <sub>p</sub> <sup>1)</sup> [W]	w <sub>ok</sub> /Δp <sub>w</sub> [kg/h]/[kPa]	Q <sub>h</sub> /Δt [W/K]	Q <sub>h</sub> <sup>2)</sup> [W]	w <sub>oh</sub> /Δp <sub>w</sub> [kg/h]/[kPa]
40	50	22	28	13	23	230	130	100 / 6.3	18	720	100 / 2.4
50	77	23	29	17	28	280	170		22	880	
60	110	26	32	20	34	340	200		26	1040	
70	150	29	35	23	37	370	230		29	1160	
80	195	33	39	27	42	420	270		32	1280	

### Technical data size 1000, 2-pipe system - cooling or heating

V [m <sup>3</sup> /h]	Δp [Pa]	L <sub>A18</sub> [dB(A)]	L <sub>wA</sub> [dB(A)]	Q <sub>p</sub> /Δt [W/K]	Q <sub>k</sub> /Δt [W/K]	Q <sub>k</sub> <sup>1)</sup> [W]	Q <sub>p</sub> <sup>1)</sup> [W]	w <sub>ok</sub> /Δp <sub>w</sub> [kg/h]/[kPa]	Q <sub>h</sub> /Δt [W/K]	Q <sub>h</sub> <sup>2)</sup> [W]	w <sub>oh</sub> /Δp <sub>w</sub> [kg/h]/[kPa]
40	50	22	28	13	24	240	130	100 / 8.5	20	800	100 / 6.2
50	77	23	29	17	30	300	170		25	1000	
60	110	26	32	20	36	360	200		30	1200	
70	150	29	35	23	40	400	230		33	1320	
80	195	33	39	27	45	450	270		37	1480	

Data is based on the unit with the inlet/outlet grille installed.

The suction air temperature at the unit is usually 1.5 K higher than the room temperature.

Standard water flow rate for heating and cooling: 100 kg/h.  
Correction values for other flow rates see pages 26/27.

1) Water supply temperature: 16 °C W  
Room temperature at a height of 1.1 m: 26 °C  
Non-condensing operation

2) Water supply temperature: 60 °C  
Air inlet temperature: 20 °C

#### Legend

- V - flow rate (± 10%)
- Δp - static pressure at primary air spigot
- L<sub>A18</sub> - sound pressure level (± 3 dB)
- L<sub>wA</sub> - sound power level (± 3 dB) (without ceiling)
- Q<sub>p</sub> - primary cooling capacity (fresh air) (± 5%)
- Q<sub>k</sub> - cooling capacity, secondary (heat exchanger) (± 5%)
- Δt - temperature difference between room air and water supply
- w<sub>ok</sub> - standard flow rate at cooling capacity
- Δp<sub>w</sub> - water-side pressure loss
- Q<sub>h</sub> - heating capacity, secondary (± 5%)
- w<sub>oh</sub> - standard flow rate at heating capacity

#### Dimensions

Flanged installation:

Size 1000 - L x W x H = approx. 1240 x 340 x 240 mm

Recessed installation:

Size 1000 - L x W x H = approx. 1198 x 298 x 240 mm  
(suitable for plank tiles 300 wide x 1200 / 1250 mm long)

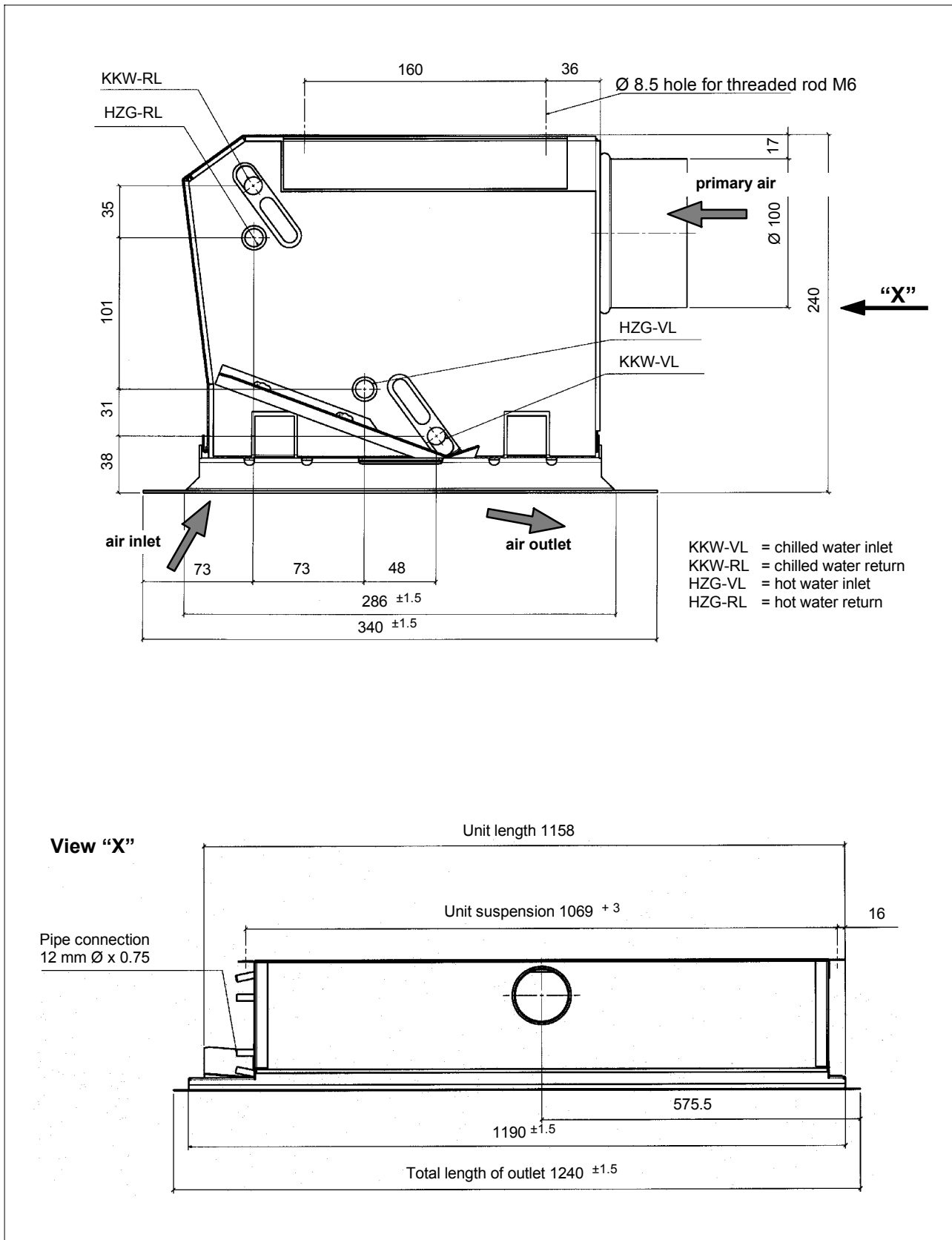
Weight: Basic unit: 17 kg without water  
Inlet/outlet grille: 6 kg

#### Accessories, special versions

Straight-way valves with electrothermal actuator

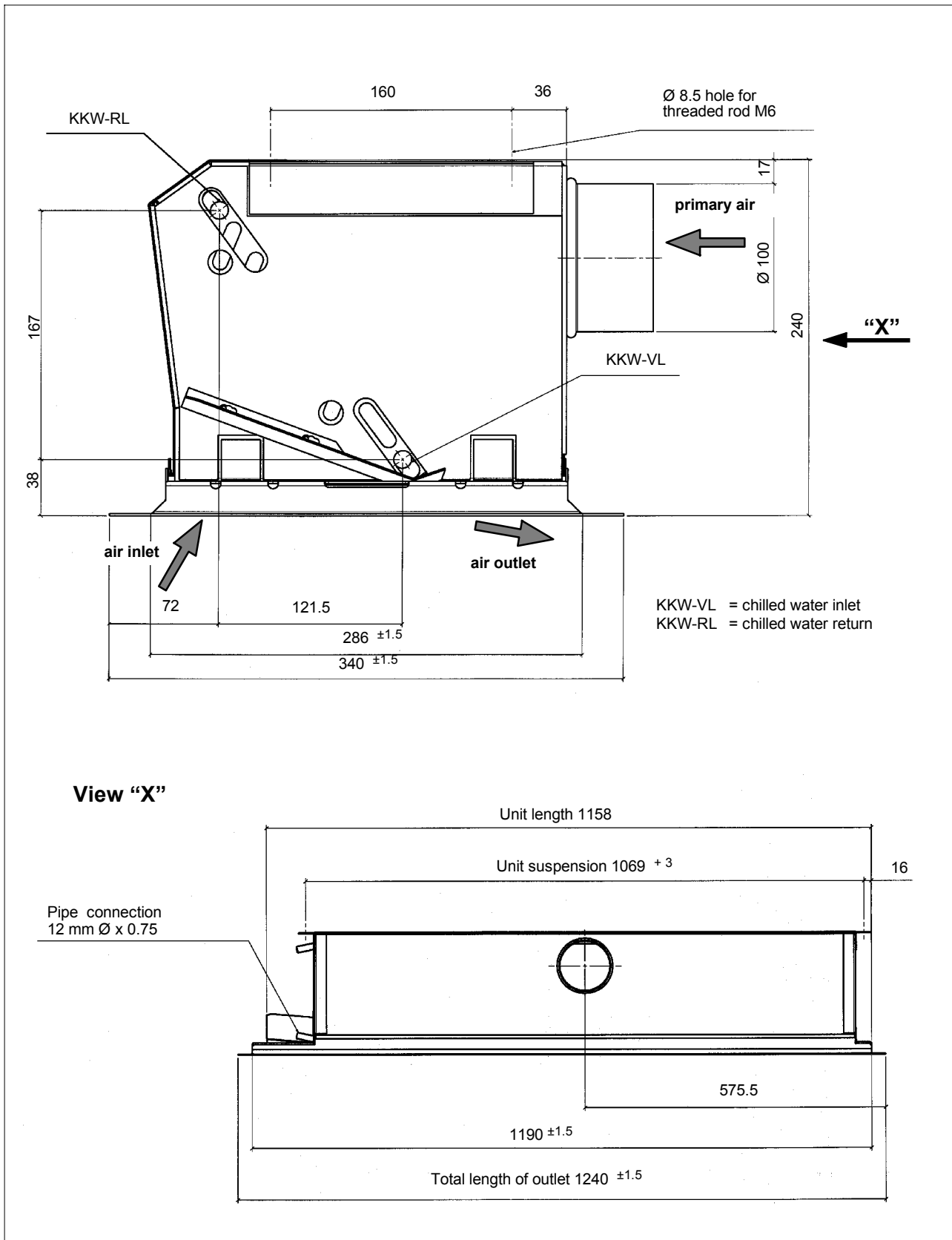
# Active chilled beams for ceiling installation Type HDC

## Dimensions size 1000, 4-pipe system - cooling and heating, flanged installation



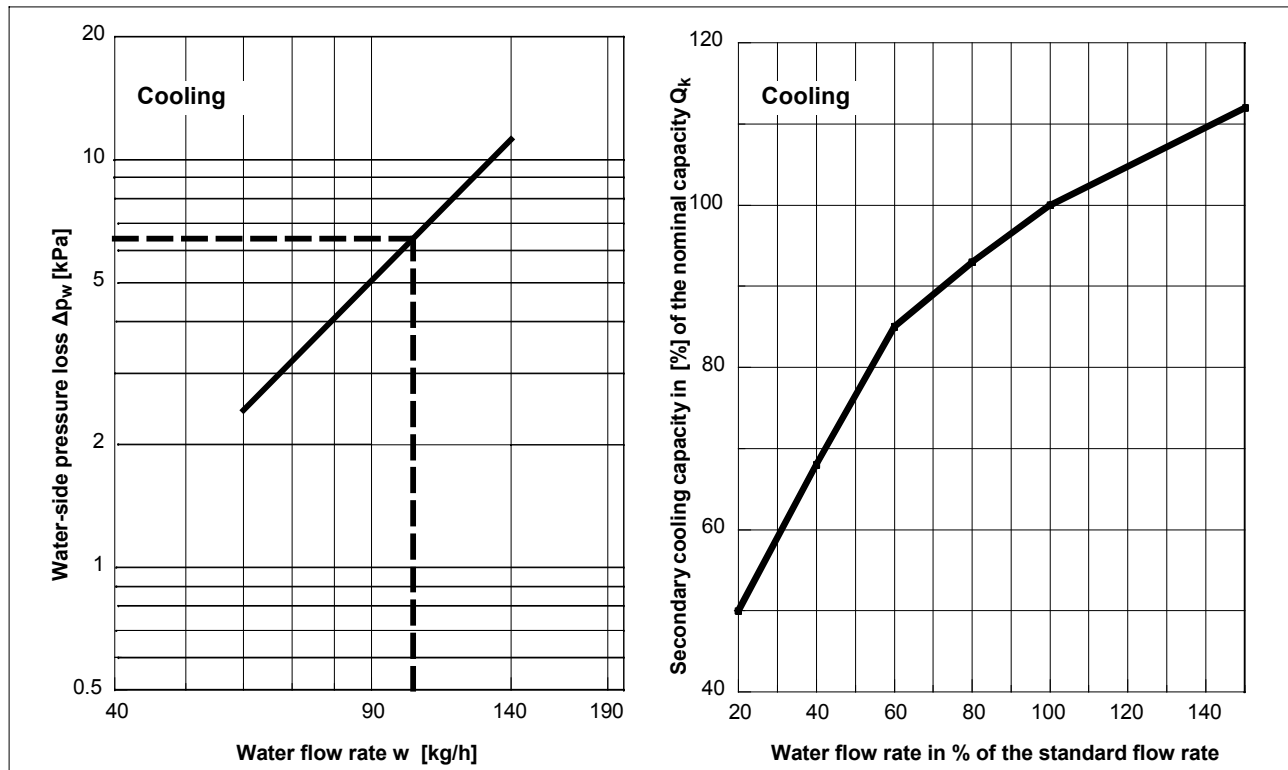
# Active chilled beams for ceiling installation Type HDC

Dimensions size 1000, 2-pipe system - cooling or heating, flanged installation

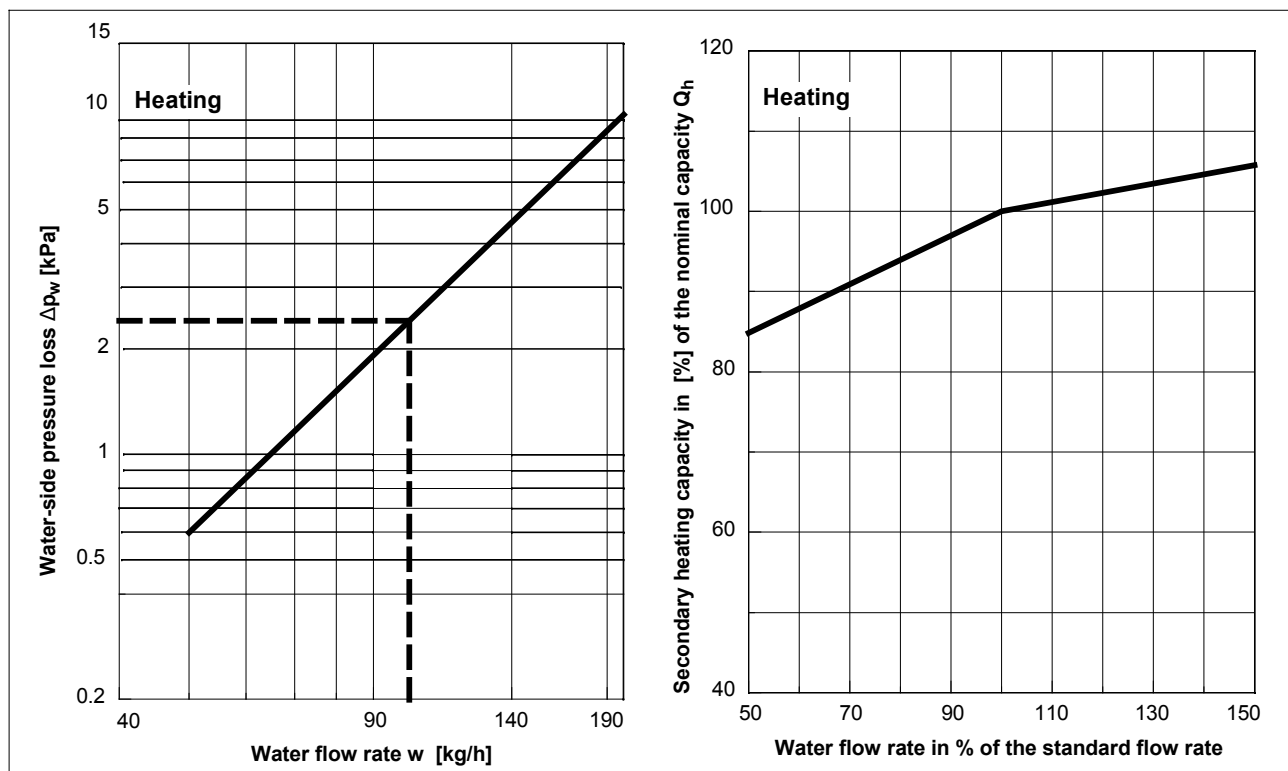


## Active chilled beams for ceiling installation Type HDC

### Water-side pressure loss and cooling capacity with different water flow rates



### Size 1000, 4-pipe system - cooling and heating, standard flow rate 100 kg/h

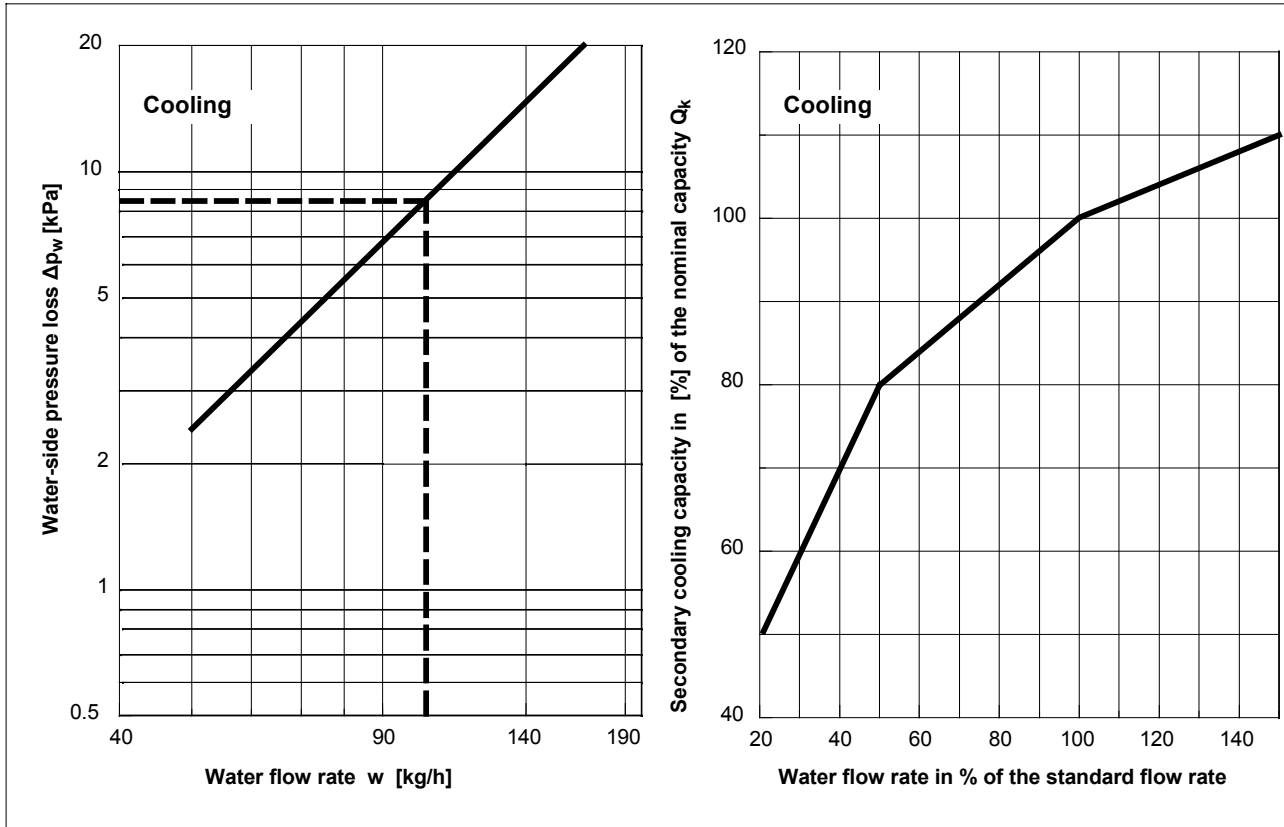


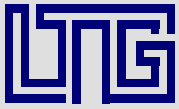
**Note:** The minimum flow rate must be at least 20% of the standard flow rate in the cooling mode and 40% in the heating mode (to ensure water-side pressure equalization).



## Active chilled beams for ceiling installation Type HDC

**Water-side pressure loss and cooling capacity for other flow rates**  
**Size 1000, 2-pipe system - cooling or heating, standard flow rate 100 kg/h**





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